NOVAG®

ZIRCON II

- **INSTRUCTION**
- **ANLEITUNG**
- **MODE D'EMPLOI**
- **MANUALE D'USO**
- **INSTRUCCIONES**

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1. GENERAL HINTS

Playing with the NOVAG ZIRCON II is simple compared to other chess computers. However we recommend reading the general instructions before starting to play. The detailed instructions are laid out in such a way that each section is self-contained, so you do not have to read everything at once.

BATTERIES
The NOVAG ZIRCON II runs on six 1,5V UM 3-type **alkaline** or heavy duty batteries **(not included)**.

Note: Do not use regular batteries as they will result in irregular performance.

To insert the batteries, open the BATTERY DOOR on the backside of the unit and place the batteries as indicated by the +/- signs. A set of new alkaline batteries runs approx. 75 hours. (continuous operation). If you don't use your computer over a long period of time, please remove the batteries.

ADAPTOR
The NOVAG adaptor (Art.No.8210) is not included with your set, but is available separately from your dealer. Please note that it is a DC 9V adaptor with 300 mA and it has a negative center. If you cannot get the NOVAG adaptor, please make absolutely sure that you do not buy an adaptor which does not have these specifications.

If you use a too powerful adaptor it might burn the components in your unit. Before using the adaptor, check that the voltage of your electric mains is within the range specified on the adaptor label.

Note: Make sure you first connect the adaptor with the computer before you plug it into the mains. The adaptor jack is at the back panel of the computer. We suggest to only use the adaptor which has been specially developed for this computer.

MEMORY
The NOVAG ZIRCON II has a long term memory and will retain the last board position. However, make sure that there are batteries in the chess computer or an adaptor connected otherwise you will lose the memory contents.

Note: If you are using the SET UP/VERIFY mode or the SET LEVEL mode the computer will save the current mode when you switch the computer off before you exit these modes. When you switch on the computer again the SET UP/VERIFY LED or the SET LEVEL LEDs will be still on. To continue the game or start a new game press the GO key first to exit these modes. If you want to start a new game, press the NEW GAME key in any case.

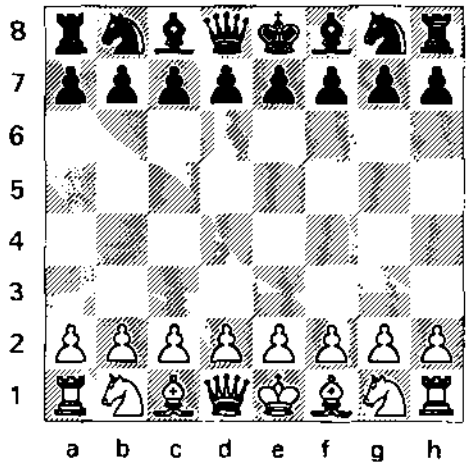
RESET SWITCH
If you cannot get your computer to work, check first the power supply carefully or use the Reset Switch on the underside of the ZIRCON II to erase the entire computer Memory.

Turn the computer upside down. Locate the hole marked 'RESET' or 'ACL' and use a pointed instrument (e.g. ballpen) to poke into this hole. Hold it for 3 seconds. The Memory has now been reset and you may continue normally. Please use the RESET facility only in case of need.

Indicator lights will be referred to as LEDs (Light Emitting Diodes) in the following instructions.

II. SHORT INSTRUCTIONS

1. Before commencing to play set up the chess pieces in the opening position. (White pieces on rank 1 and 2, Black pieces on rank 7 and 8).



2. The power switch is a 2-position switch and located at the back panel. (ON=black switch is pushed towards the power socket). This switch operates both adaptor or batteries. If you use the adaptor it will automatically cut off the batteries.

3. Press NEW GAME and you will hear 3 beeps and the LCD shows "**00:00**". You can now make your opening move for White.

4. The NOVAG ZIRCON II has 48 skill levels. To set the computer to any of the 48 levels press repeatedly the key marked SET LEVEL. The desired skill level is indicated by the 2 corresponding rank and file LEDs which will light up (square a1, a2, a3 etc. up to f8 equals one level). A better alternative in setting the playing level is by pressing the square corresponding to the desired level. (see IV.2.)

   Note: The 48 levels are divided into 7 groups (**tr**=Tournament levels, **At**=Average Time levels, **Sd**=Sudden Death Levels, **Fd**=Fixed Depth levels, **An**=Analysis levels, **EA**=Novice levels and **in**=mate-in-x). More details on the last group you will find under paragraph IV.3. SOLVE MATE FUNCTION.

   Repeated pressing of the SET LEVEL key will cycle through the above level groups and the LCD will indicate each group by its abbreviation.

   Each group is divided into 8 levels which can be selected by pressing the corresponding square.

   Example: To set Sudden Death Level 5, press SET LEVEL until the LCD shows "**Sd 1**" now press square **c5** and the LCD shows "**Sd 5**" which corresponds to Sudden Death Level 5.

5. Once you have set the desired level, press GO to exit the SET LEVEL mode. After this procedure you may enter your White move. Gently press down the piece you want to move and the two respective rank and file LEDs light up. Then set the piece on the square you wish to move to and press it down again. Again the rank and file LEDs of the corresponding square light up and the LCD will show your completed move which shows that the computer has registered your move.

   Note: The LCD also shows the accumulated time and up count (down count only for Sudden Death levels) during the player or the computer are thinking.

If it was a legal move the ZIRCON II starts to compute its counter-move. When the move has been chosen, the computer will show on the LCD its move and also light up the rank and file LEDs that correspond to this move. A captured piece must be removed simply by taking it off without applying pressure.

III. GAME FEATURES

a) Making a Move

The NOVAG ZIRCON II has a SENSOR-CHESSBOARD which registers your moves automatically when the appropriate squares have been gently pressed. Moves to be executed for the ZIRCON II are indicated by the 2 x 8 rank and file LEDs and on the LCD display. Each square on the chess board is named according to the standard adopted by the World Chess Federation (F.I.D.E.) which are the coordinates of each square from A1 to H8, all moves are also shown on the LCD.

To start, press the NEW GAME key and you automatically play White (the red LED for WHITE lights up). To execute your first move e.g. e2 - e4, gently press down the white pawn on square e2 and set it on the square e4 by pressing it down again. Each time the respective rank and file LEDs light up to indicate that the computer has registered your move. The ZIRCON II starts then immediately to calculate its counter-move (the green LED for BLACK will be blinking whilst the computer is calculating.)

When the computer has found its move the rank and file light indicate the "**from**" square of the piece the computer wants you to move. Press this piece gently on the "**from**" square and place it on the "**to**" square. Please enter the indicated move by pressing these squares. Each pressing on a square is accompanied by 1 beep unless switched off. (see IV.15.)

Note: When the NOVAG ZIRCON II is computing, most key presses will be ignored except for the GO key which will interrupt its computation and force the current move being analyzed to be played at once. In addition you may also activate the NEW GAME key to start a new game as well as the HINT and INFO key. The computer will indicate on the LCD the move it is considering at the moment and will provide information on the current game.

b) Capturing a Piece

If the computer indicates a move onto a square that is occupied by the opponent's piece, this means that the piece is captured and must be removed from the board. Simply take it off without applying pressure. If you wish to make a capture remove the captured piece and make your move normally.

c) Impossible and Illegal Moves

The NOVAG ZIRCON II is programmed in accordance with the International Chess Rules and does not accept nor make illegal moves. Corrections of illegal moves or mistakes in executing computer moves are very simple.

- If you try to make an illegal move, you hear 3 beeps and on the LCD display you will see the "**Er r**" sign. Retract your move without pressing on any square. You can now make another legal move.

- If you try to move the wrong piece when executing a computer move, you hear 3 beeps and the rank and file LEDs of the correct square will light up. To execute this move correctly, press gently on the square indicated.

If you want to rectify a mistake or if you want to play a different strategy, wait until it is your turn and press then the TAKE BACK key. (see IV.9.)

d) Castling

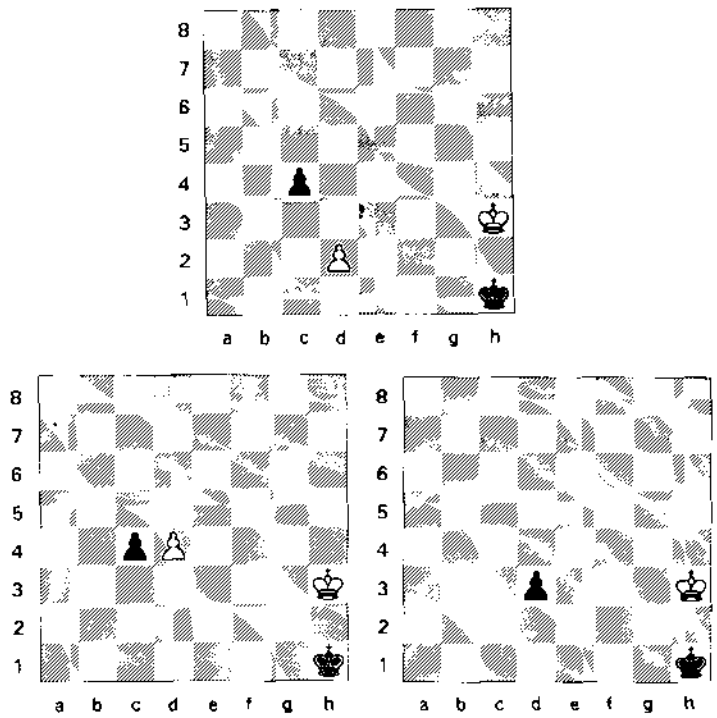
According to the rules, when castling, just move the King and then the Rook. Both pieces are moved by pressing them down gently like in any other move. The computer will indicate the squares that you will need to press.

Note: You may not castle your King into check, out of check or through check.

The NOVAG ZIRCON II accepts and executes castling in set-up board positions.

e) En Passant

If you make this special pawn capture you only have to enter the "**from**" and "**to**" squares of this move as in a normal move. Please remember to remove the captured pawn from the board. You or the computer may capture En-Passant in set-up board positions. Press the indicated square and remove the pawn to let the computer know that it may continue.



Official Rules of Chess:
A pawn attacking a square crossed by an enemy pawn which has been advanced two squares in one move from its original square may capture this enemy pawn as though the latter had been moved only one square. This capture may be made only on the move immediately following such an advance and is called capturing "**en passant**".

f) Pawn Promotion / Underpromotion

If one of your Pawns reaches the opposite side of the board, the chess computer will allow you to promote or underpromote it to any desired piece.

As soon as this happens, the rank and file LEDs of the square light up and the word "**Pro?**" will be shown on the display. You can now choose the pieces you want to promote / underpromote to by pressing the respective piece symbol key. The LEDs will disappear and the computer will start computing its counter-move.

If the computer pawn reaches the opposite side of the board, the computer indicates on the LCD display into which piece the pawn will be promoted / underpromoted. Place the promoted piece with pressure onto the indicated square. You can always verify the promoted piece position (see IV.13).

Note: The computer also accepts pawn promotions in set-up board positions.

g) Stalemate and Draw

A Stalemate is announced by the STALE and MATE LEDs.
A Draw is announced by the STALE LED only.

h) Check and Checkmate

If the computer puts you in check the CHECK LED will light up. It is not legal to leave your King in check. If you put the chess computer into check this will not be specifically displayed.

In a checkmate situation you will hear 3 beeps and the CHECK and MATE LEDs come up indicating the end of the game.

i) Mate Announcement

Your chess computer will always announce mate if it sees it. The LEDs on the left side of the board will flash to indicate the mating depth and the display shows the mating depth as "**n 03**" for example which means a mate-in-3.

The NOVAG ZIRCON II is featured to announce mate up to Mate-in-8.

IV. SPECIAL FUNCTIONS

1. NEW GAME Key

Pressing NEW GAME will start a new game. The previous game is cancelled and in the computer memory all pieces are now in the opening position.

Press NEW GAME every time you switch the computer on or whenever you wish to commence a new game. The playing level set will be retained.

2. SET LEVEL Key

Your NOVAG ZIRCON II has 48 different levels of skill to suit every type of playing conditions that you wish to set. These are divided into 6 sections (plus section SOLVE MATE) and they are listed below.

To set the NOVAG ZIRCON II to any of the 48 levels press the SET LEVEL key. Each further press will advance to the next level group and you will see on the LCD the abbreviation (tr, At, Sd, Fd, An, EA) of the level that you have selected. Please refer to the level table for the meaning of each of the 48 levels. To set the required level of each level group press the corresponding square on the "**a**" through "**f**" columns.

A better alternative in setting the playing level is by pressing the square corresponding to the desired level (a1, a2, a3 etc. up to f8). To exit this mode always press GO.

Note: Column "**g**" represents the last group **in**= mate-in-x. (See IV.3).

Example: If you wish to set level At 4, press the SET LEVEL key and the square B4. The corresponding LEDs will light up and on the LCD display you will see "**At 4**" indicating the level which is set up. Once you have set the desired skill level press GO to exit this mode.

You can always check or change the skill level during a game, however not whilst the computer is calculating. Changing level resets the clocks.

Note: If you switch the computer off to continue your game at a later time or if you start a new game, the previously set skill level will be retained.

NUMBERING SYSTEM FOR THE SECTION OF PLAYING LEVELS ON THE CHESS BOARD

8	TR8	AT8	SD8	FD8	AN8	EA8	IN8	
7	TR7	AT7	SD7	FD7	AN7	EA7	IN7	
6	TR6	AT6	SD6	FD6	AN6	EA6	IN6	
5	TR5	AT5	SD5	FD5	AN5	EA5	IN5	
4	TR4	AT4	SD4	FD4	AN4	EA4	IN4	
3	TR3	AT3	SD3	FD3	AN3	EA3	IN3	
2	TR2	AT2	SD2	FD2	AN2	EA2	IN2	
1	TR1	AT1	SD1	FD1	AN1	EA1	IN1	
	A	B	C	D	E	F	G	H

Description of Level Time Controls:

- **Tournament Level TR 1 - TR 8 :**
  For tournament time controls. All moves are pre-set which have to be played within a fixed time, e.g. 40 moves in 120 min. (level 8 is the strongest). If you or the computer exceed the specified time control, the game will be declared lost.

- **Average Time Level AT 1 - AT 8 :**
  The NOVAG ZIRCON II will only use the time selected.

- **Sudden Death Level SD 1 - SD 8 :**
  For play to the finish. The computer has to finish its game within a given time. If you or the computer exceed the specified time control, the game will be declared lost (clocks count down to zero and 3 beeps warn you if you overstep). If you wish you can continue to play and finish the game. On the LCD display the total time used will be shown and will count continuously.

- **Fixed Depth Level FD 1 - FD 8 :**
  Important for analysis purpose. The computer will only compute up to the depth selected.

- **Analysis Level AN 1 - AN 8 :**
  These levels provide deeper searches for more difficult problems.

- **Novice Levels EA 1 - EA 8 :**
  Here the NOVAG ZIRCON II will not compute on opponents time, therefore its play is weaker. The NOVAG ZIRCON II limits its capture search up to the specified number of half moves.

LEVEL TABLE

Level	Description		Level	Description	
TR 1	40 moves in	5 min.	FD 1	search only	1 half move
2	40 moves in	15 min.	2	search only	2 half moves
3	40 moves in	30 min.	3	search only	3 half moves
4	40 moves in	60 min.	4	search only	4 half moves
5	40 moves in	90 min.	5	search only	5 half moves
6	40 moves in	100 min.	6	search only	6 half moves
7	40 moves in	120 min.	7	search only	7 half moves
8	40 moves in	150 min.	8	search only	8 half moves
AT 1	2 sec.	per move	AN 1	search only	9 half moves
2	5 sec.	per move	2	search only	10 half moves
3	10 sec.	per move	3	search only	11 half moves
4	15 sec.	per move	4	search only	12 half moves
5	30 sec.	per move	5	search only	13 half moves
6	1 min.	per move	6	search only	14 half moves
7	2 min.	per move	7	search only	15 half moves
8	3 min	per move	8	search only	16 half moves
SD 1	game in	3 min.	EA 1	restricted	1 + 2 ply capture search
2	game in	5 min.	2	restricted	1 + 3 ply capture search
3	game in	10 min.	3	restricted	1 + 4 ply capture search
4	game in	15 min.	4	restricted	1 + 5 ply capture search
5	game in	30 min.	5	restricted	1 + 6 ply capture search
6	game in	60 min.	6	restricted	1 + 7 ply capture search
7	game in	90 min.	7	restricted	1 + 8 ply capture search
8	game in	120 min.	8	restricted	1 + 9 ply capture search

3. SOLVE MATE FUNCTION Key

The NOVAG ZIRCON II can solve most chess problems as well as mate problems up to Mate-in-8 even those that require castlings, en passant captures or pawn promotion / underpromotions. Press NEW GAME and set up the required board position (see IV.14). Before you start the mate search, it is advisable to verify the set-up board position via the VERIFY key and make sure that the colour to move is correct, if not change this by pressing the CHANGE COLOR key.

To set the depth of the mate search press the SET LEVEL key until the correct indication (in -) is shown on the display (see IV.2).

Examples: Indication **"in - 5"** stands for mate-in-5. Select the mate-in number by pressing any of the squares G1 to G8. Press GO once to exit the setting up of the mate search and then press GO a second time and the computer begins with the mate search.

If there is a solution, the computer will show you first the move to execute and then the LCD will indicate the mate solution. If there is no solution you will see **"no nE"** on the LCD.

Example: If you like to make a quick test set the following position up:

- White King on E4
  White Queen on B5
  White Bishop on A5
  Black King on C8
- Ask your NOVAG ZIRCON II to find a Mate-in-3 moves.
- ZIRCON II will make its first move for White: Db5 - b2. Now you can search for the correct solution. If you need help use the HINT key and ZIRCON II will show you the next move for Black and so on.

(Solution: 1. Db5-b2, Rc8-d7 / 2. Db2-e5, Rd7-c8 / 3. De5-c7 MATE)

4. GO Key

The GO key is used to enter a command or to exit from a special function:
SET UP / VERIFY / SET LEVEL / AUTOPLAY / SOLVE MATE. These functions are explained in their respective paragraphes.

Furthermore the GO key is used:

- To make the NOVAG ZIRCON II compute for the side to move, even if in REFEREE mode.
- To interrupt the computing time and call-off a computer move instantly. The computer will make the move it currently considers the best. Please allow at least 5 seconds of search time before pressing this key in order to let the computer calculate a reasonable move. The evaluations of these moves do not correspond with the evaluation of the set-up level.
- To change sides during a game. Wait until it is your turn to move then press GO. The computer will now compute a move for your colour, while you play the other colour from now on.
- To let the computer play against itself, which might be of special interest at a certain point during the game or for learning purposes. Every time you press GO the computer calculates for the side to move. All moves will be computed according to the set skill levels.

5. RANDOM Key

Every time you switch the computer on, automatically the move with the highest rating is chosen, based on the depth of the search which is determined by the skill level. This is always the case after the opening is finished. However, this may not always provide the desired variety.

If you press the RANDOM key you can choose various levels of randomness (rAn 1/2/3/4). Level "**rAn 1**" is the least random. The computer will select a move at random from a list of possible moves which are similar in their evaluation.

6. REFEREE Key

In this mode you disable the computing of moves by the computer so you may make moves for White and Black, while the computer still checks their legality. This feature may be used to enter particular book openings or to allow 2 players to challenge each other.

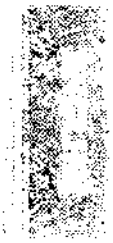
You may enter into this mode at the beginning or during a game before you make your next move. Press the REFEREE key and the LCD will show "**rEF on**" or "**rEF off**". Press REFEREE while displayed to change the current status. The following features are still available while in this mode:

TAKE BACK / CHANGE COLOR / HINT / SET UP / VERIFY / SOUND / GO.

7. HINT Key

The NOVAG ZIRCON II can suggest moves, if you are not sure how to continue your game, which is a great tutoring feature. When it is your turn press the HINT key and the computer will show the move it considers the best for the colour to move (the move will be shown on display and the LEDs are flashing). You can accept any suggested move or may make a move of your choice even while a HINT is being displayed. If you accept the suggested move simply press GO and the computer will immediately reply with its counter-move.

In case of castling, you are requested to press the "**from**" and "to" square of the rook piece.



If you press the HINT key whilst the computer is calculating, the display will show the move the computer would play if the GO key was pressed.

The suggested move is the best possible move in this position computed by the ZIRCON II at the level preset by you.

8. TRAINING Key

This function is to help the novice player:

Step One : When it is your turn to move press the TRAINING key and the computer will show the "**from**" square (indicated by the lit up LEDs and on the LCD) of the first piece with a legal move.
If you continue to press the TRAINING key, the NOVAG ZIRCON II will show you all pieces with at least one legal move. You may cycle through this step as often as you wish.

Step Two : Once you have selected a piece, press GO and the TRAINING key. Each press of the TRAINING key will show you now all legal "**to**" squares this piece can be moved to.

Step Three : Press GO to have the computer accept the move as displayed and the computer will immediately start to calculate its counter-move.

If you wish to make a move other than displayed execute the move of your choice.
Should you wish to go back to Step One, use the CLEAR/CLEAR BOARD key to reset the LCD and then press the TRAINING key to go to Step One.

9. TAKE BACK Key

The NOVAG ZIRCON II allows you to take back 138 half moves to enable you to rectify an earlier mistake or to play a different strategy.

Wait until it is your turn to move. Press the TAKE BACK key and the move is shown on display and the LEDs of the "**to**" square are on. Execute this move as any other ordinary one, i.e. by applying pressure on both squares as indicated.

Every time you press TAKE BACK the computer will reverse the last move. If a captured piece has to be replaced, the rank and file LEDs of that square light up and the piece type and square is also shown on the LCD. Place the captured piece on that square by applying gently pressure and the LEDs will disappear. To exit this mode make your next move or ask for the computer's next move by pressing the GO key.

Note: If you select CHANGE COLOR or SET UP to alter the position of any of the pieces, all the prior moves will be deleted and you may not TAKE BACK moves before the change of colour or position. If no moves are in the game history the LCD will show "**beg**".

10. TRACE FORWARD Key

This key is mainly used for tracing forward all moves after using the TAKE BACK function. Every press of this key will replay a move of the current game until all moves in memory have been replayed. This is indicated by the word "**En d**" on the LCD.

11. CHANGE COLOR Key

The computer is generally set to play Black and you White. If you want to play Black in a new game, set up the Black pieces on rank 1 and 2 and the White ones on rank 7 and 8, in that case disregard the notations along the chess board.

Now press: NEW GAME Key - CHANGE COLOR Key - GO Key

The computer will make its opening move for White from the top of the board, while you have your Black pieces in front of you.

The CHANGE COLOR key can be pressed at any time during a game and the colour to move will be reversed. Any moves made prior to pressing this key will be erased and the game history will begin with this position.

If you are in the SET UP mode, you can choose the colour to move first via the CHANGE COLOR key (see IV.14.)

12. CLEAR / CLEAR BOARD Key

This key has two functions:

- If you want to set up a board position, it is best to clear the entire chess board before entering the desired position. First remove all pieces from the board and set up your new position without pressing down on any square; then enter this position as follows:

  - Press the VERIFY/SET UP key twice.
  - Then press the CLEAR BOARD key to cancel all pieces from the computer memory.
  - Now enter your position piece by piece into the computer as described in paragraph IV.14.
  - To end this mode, press the GO key.
  - The colour to move can be changed via the CHANGE COLOR key.

- If there are messages on the LCD display you can clear them by pressing this key.

13. VERIFY Key

This key has a double function:
a) On the first press you will enter the VERIFY mode and the LCD will show "**VEr**".
b) On the second press you will enter the SET UP mode and the LCD will show "**SEt**".
c) To exit either of these modes press the GO key.

At any point in a game or after entering a board position you can check the position of any number of pieces. You can also check each square to see if it is occupied and by which piece.

Note: To enter this mode, wait until it is your turn to move and proceed as follows:

- Press VERIFY and the indication "**VEr**" on LCD will confirm this mode.

- The BLACK or WHITE LED lights up, indicating the colour of pieces that can be verified. The colour can be changed by pressing the CHANGE COLOR key.

- Choose the piece(s) to be verified via the **Piece Symbol Key** one after the other and as often as needed. The 2 corresponding rank and file LEDs will light up, indicating the position of the pieces which have to be verified. In addition the piece symbol and square position is shown on display.

- Another way to verify the position of any piece is to press on the square and the piece type, and the square position are shown on display. The correct colour is indicated by the BLACK or WHITE LED.

- You may exit this mode any time by pressing the GO key. Enter now your next move or call off a move for the computer.

Note: The following abbreviations on the LCD display are used to characterize the chess pieces.

Symbols	Explanation	
H	K	King
q	Q	Queen
b	B	Bishop
n	N	Knight
r	R	Rook
p	P	Pawn

If a square is not occupied the LCD will just show the position of that square (no piece type indication).

14. SET UP Key

This mode is designed to enable you to set up board positions to solve chess problems or to set handicaps by removing or entering a piece, as well as changing the positions of pieces. In SET UP mode the computer's legality check as to the movement of pieces is disabled and you can enter, remove or change positions of any piece. However you cannot set up an incorrect position, e.g. play without both kings or with more than one king for each color. . . . etc.

If you exit the SET UP mode with an illegal position, you will hear three beeps and **"Err"** sign will be on display. You may enter SET UP again to correct the position.

The computer will accept and execute castlings, pawn promotion and en- passant captures if you play from a set up board position.

Note: All previous stated moves are cancelled as soon as you make the change in SET UP mode.

To enter this mode press the SET UP / VERIFY key twice or if you are already in the VERIFY mode once. Before you make any key entries, first make sure that the colour LED which is on is correct and if not press the CHANGE COLOR key to change this. Next press the key with the symbol of the piece that you wish to enter then the square where you wish to place this piece. Subsequent pieces of the same kind and same colour can be entered without using any further function key. To exit this mode press the GO key or change to the VERIFY mode.

a. Removing a piece / clearing the entire board

- Press the SET UP key twice, if you are not yet in the SET UP mode.
- To remove a piece just press the square on which it presently stands.
- To clear the entire board of all pieces press the CLEAR BOARD key.
- To end this mode press the GO key or change to the VERIFY mode to check the new board position.

b. Entering a piece / setting up a board position

- Press the SET UP key twice, if you are not yet in the SET UP mode.
- To move a piece from one square to another, simply press the present location of the piece that you wish to move. Next press the square that you wish to move this piece to.
- To set up a board position clear the board by pressing the CLEAR BOARD key.
- Select the piece to be entered via the Piece Symbol Key. Enter then the piece by gently pressing it on the desired square. The respective rank and file LEDs will light up.
- Only change colour or use the Piece Symbol Key again, if the piece or colour varies from the preceeding piece or colour.
- To end this mode press the GO key.

Note: After having left the SET UP mode, if a change of colour is required, press the CHANGE COLOR key. You may now enter a move for the indicated colour or make the computer move by pressing the GO key.

15. RESTORE KEY

This functin allows you to restore the board position to the very beginning of the game. The computer can store 138 halfmoves in its memory which normally will draw you to go back to the new game postion.
If however the game was started from a SET UP position or if more than 138 halfmoves have been played the game will be at the opening position. After pressing the RESTORE key the display will show "**bEG**" and then "– – – –" to indicate the beginning of the game history.

Note: You may use the complementary function key TRACE FORWARD to replay through the entire game. Should you enter a move for your colour whilst in RESTORE or TRACE FORWARD mode, you will erase all the game history and your NOVAG chess computer will treat this as a new game.

16. SOUND KEY

The NOVAG ZIRCON II has four different sound settings, which will be indicated on the LCD display.

a) Setting 1 (Snd 1) : There will be no acoustic signals at all.
b) Setting 2 (Snd 2) : There will be an acoustic signal only when the computer answers with its counter-move.
c) Setting 3 (Snd 3) : There will be an acoustic signal when pressing any key and when the ZIRCON II or you make a move.
d) Setting 4 (Snd 4) : The same sound setting as mentioned under c) and in addition you will hear a warning signal (double beep) to indicate that one of yours pieces is threatened by the computer. The LEDs and the LCD will flash and indicate the position of the threatened piece.

Note: Press the SOUND key to select the required sound setting. To exit this mode make a move or press GO to call off a computer move.

17. AUTOPLAY Key

The NOVAG ZIRCON II may be set to play against itself and you may want to do this to watch an interesting game or to analyse a problem position overnight.

Press the SET LEVEL key and select the level of skill. Press now the AUTOPLAY key and select the required setting (display shows **"Aut on"**, **"dE n on"** or **"Aut off"**). To start any of the selected settings press the GO key. This immediately starts the NOVAG ZIRCON II playing against itself at the current level setting. All moves are executed automatically by the computer and you may keep track of the game by making the moves on the board according to the blinking rank and file LEDs. (All moves are also shown on display.)

Note: You do NOT need to press any square at all.

Setting " Auto on " : will allow the NOVAG ZIRCON II to play against itself until the end of the game (1 game only).
Setting " Demo on " : will allow the NOVAG ZIRCON II to play against itself continuously (at the end of a game the computer will restart with another game).
Setting " Auto off " : will allow the NOVAG ZIRCON II to exit setting "Auto on" or "Demo on". The game may be continued normally.

Note: To exit this mode whilst the computer is still executing opening moves, press the NEW GAME key but please bear in mind that this will cancel the current game.

Once the game is more advanced (out of the opening book) you can press the GO key to exit the Autoplay mode. The move currently being computed will be executed before the computer exits this mode.

If you want to learn more about chess, we suggest to call off single moves for each side via the GO key, which gives you more time to study each move.

18. INFO Key (Game Information)

- **First press** on the INFO key (the display shows "SCR =Score") will show how the computer evaluates the position for the current side to move. If the computer sees that it can force a mate, when in INFO mode, the display shows the mating depth as "n 03" for example which means a mate-in-3. Disadvantageous evaluations are marked with a " – " sign. For example if the computer sees it is going to be mated then the score could be "**–n 03**".
- **Second press** on the INFO key will show the elapsed time of the current move so far. (the display shows "ELt" = elapsed time)
- **Third press** on the INFO key will show the number of moves made so far. (the display shows "Cnt" = count)
- **Fourth press** on the INFO key will show the total time for White or Black used so far. (This would be a down count time when a Sudden Death (SD) Level is set.)

Example: For White to move the display will show "**Cnt 12**" and for Black to move the display will show "**Cnt12_**":

Note: You can clear the LCD display by pressing the CLEAR key. This mode only displays information. To exit this mode no keys have to be used. The INFO key may be used whilst the computer is thinking.

GAME INFORMATION

Rotational game information of the computer's thought process:
You can see its current predicted line of play and then (when it makes its move) the actual line it plays.

Example:

Line 1 – C8 F5 Line 2 – F1 E4 Line 3 – F5 E5	Line 1 - 3 indicate the predicted sequence of move.
Line 4 – 5 75	This is the evaluation value, i.e. the computer's estimation of the current position. A positive value indicates that the side to move leads. The value is based on a positional and tactical evaluation. A value of 100 means that the side to move has an advantage of one pawns.
Line 5 – d 09	Indicates 9 half moves depth has been reached.
Line 6 – 15 32	Indicates that there are still 15 searches out of 32 searches in this position.
Line 7 – 34 :50	Indicate the elapsed time during this thought process so far.

19. EASY Key

The NOVAG ZIRCON II always uses the opponent's time to compute its best response which is quite an advantage as it will sometimes reply instantly (even if the move appears difficult) since it has predicted your move and completed its assessment of your move. To disable this advantage please use the EASY key. When this mode is activated you will see the message "**ESy on**" on the LCD and if turned off you will see "**ESy off**". This key acts as a toggle with alternate key presses turning it ON and OFF.

20. NEXT BEST Key

It may be of interest to you to know which move in a given position is the next best choice with its evaluation equal or just less than the move just played by the NOVAG ZIRCON II.
To activate this function press the SET LEVEL key and then the NEXT BEST key. This enables the computer to take back its last move and compute the NEXT BEST move (alternate move).

V. APPENDIX

A. Care of the NOVAG chess computer

Dirt or dust can be removed with a soft cloth. Do not use any chemical solvents or water on the set. Any damage caused by their use invalidates the warranty.

Always keep the computer in a dry and cool place (normal room temperature). Avoid exposing the computer to heat, e.g. spot lights, radiators, sunshine etc. as this may lead to permanent damage caused by overheating, which is not covered by the warranty.

Warranty: For details please refer to the enclosed Warranty Card.

B. Trouble shooting list

All NOVAG computers are extensively tested before leaving the factory to ensure trouble free operation. However if you encounter problems when using the NOVAG ZIRCON II please refer to the list below before sending the unit back to your dealer.

1. The computer does not work and the LCD is blank. Please check if your batteries have sufficient charge, always use heavy duty or **alkaline batteries** for reliable performance.
2. The NOVAG ZIRCON II locks up and will not respond to any key press or all the LEDs light up and the computer is completely blocked.
   Please reset the computer by following these instructions:
   a) Turn the computer on its back and locate a hole marked ACL.
   b) Use a long and sharp instrument to push into this hole and hold for at least 3 seconds.
   You may now continue using the NOVAG ZIRCON II normally.
3. The blinking of the LEDs is slower.
   The power of the batteries is insufficient, please change the batteries.
4. One of the LEDs does not light up.
   Go into the VERIFY mode and check all the rank and file LEDs by pressing on every square. If that particular LED still does not light up when it is supposed to please send in your NOVAG ZIRCON II to your nearest dealer.
5. One of the squares does not register a move.
   If there is no beep when you press this square (SOUND must be ON) then you should send in your NOVAG ZIRCON II to your nearest dealer.

C. Technical Data and Features

• Programme Size	32K Byte ROM, (Read-Only-Memory). 1K RAM (Random-Access-Memory)
• CPU Clock Speed	26.6 MHz
• H8 RISC Style Processor	
• Power Consumption	20 mA Minimum, 50 mA Maximum
• Battery Operated	6 x 1.5V UM-3 **alkaline batteries**
• Adaptor Operated	Art. No. 8210 (9V DC rating 250mA), or Universal 9V DC
• Opening Book	Over 13,000 halfmoves
• Playing Levels	48 plus 8 Solve Mate Levels
• Game Memory	Game kept on when power off and will keep while the batteries last.
• Take Back/Trace Forward function	138 halfmoves
• Solves Mate function	Up to mate-in-8
• Depth Search at Tournament level	Generally 8 ply (for endgames the depth will go to 9 ply)
• Verify / Set Up function	
• Hint and Training function	
• Official grade	2241 (USCF)
• Measurements	273 x 275 x 28 mm

All data subject to change without notice.

D. RULES OF CHESS

I. GENERAL MOVES

1. The two players must alternate in making one move at a time. The player with the white pieces moves first to start the game.
2. With the exception of castling (section II.1.), a move is the transfer of a piece from one square to another square which is either vacant or occupied by an enemy piece.
3. No piece, except the Rook when castling and the Knight (section II.5) may cross a square occupied by another piece.
4. A piece moved to a square occupied by an enemy piece captures it as part of the same move. The captured piece must be immediately removed from the chessboard by the player making the capture.
5. When one player moves a piece into a position whereby he can attack the King, the King is in "Check" (announced by the CHECK LED) and must either
   a) move the King,
   b) block the path of the attacking piece with another piece,
   c) or attack the attacking piece.
6. The game is over when there is no escape for the King from an attacking piece. This is known as "Checkmate" (announced by the CHECK and MATE LED)

II. INDIVIDUAL MOVES

1. KING

Except when castling, the King can move only one space to any adjoining square (including diagonally) which cannot be attacked by an enemy piece. Castling is a move of both the King and either Rook which counts as a single move (of the King) and is executed as follows:

a) The King is moved from its original square two squares toward either Rook on the same row, and

b) The Rook is moved to the opposite side of the King.

Castling cannot occur *if:*

a) the King has already been moved.
b) the Rook has already been moved.
c) the King's original square or the square which the King must cross or the one which it is to occupy is attacked by an enemy piece.
d) there is any piece between the King and the Rook.

2. QUEEN

The Queen can move to any square along the same row, column or diagonal on which it stands (except as limited by Article 1.3).

3. ROOK

The Rook can move to any square along the same row or column on which it stands (except as limited by Article 1.3)

4. BISHOP

The Bishop can move to any square along the same diagonal on which it stands (except as limited by Article 1.3).

5. KNIGHT

The Knight's move is in the shape of an "L", moving two squares horizontally vertically, and then one square at 90° angle from the first move. These two moves can be reversed (one square and then two) if desired.

6. PAWN

The Pawn can move either one or two squares forward on its original move, and then one square forward at any time afterward. When capturing, it advances one square diagonally (forward). When a Pawn reaches the last row, it must be immediately exchanged for a Queen, Rook, Bishop, or a Knight of the same colour as the Pawn, at the player's choice and without taking into account the other pieces still remaining on the chessboard. This exchange is called a "promotion".

A Pawn can attack a square crossed by an enemy Pawn which has been advanced two squares in one move from its original square as though the latter had been moved only one square. This capture may be made only on the move immediately following such an advance and is called capturing "en passant". (When your computer makes an en passant capture it will display the symbol "ep".) The en passant moves is also described under section 6.b in this instruction.

III. HINTS & TIPS

Get a feel for the values of different pieces, which will be useful when making decisions on captures and exchanges. In general, try to capture the more valuable pieces. Some important principles:

- Castle your King into safety as soon as possible.
- If you control the center squares, this will give you the advantage. To do this, move your center pawns and develop your Bishops and Knights early in the game.
- Take advantage of capture situations, particulary if you will gain material
- Concentrate – don't be caught off guard by your opponent!